



Managing the storage of flammable liquids

Workplace fires and explosions endanger the safety of workers and can destroy expensive equipment and buildings. Many facility fires are preventable when practices and procedures to safely store, use and dispose of flammable liquids are established and followed.

Flammable liquids

It is difficult to find a workplace that does not use, store or handle flammable liquids. Their abundance and the frequency of their use can sometimes cause workers to disregard their hazards.

There are four categories of flammable liquids. Some common flammable liquids are listed on the back. The flammable properties of a liquid, such as flashpoint, boiling point, upper and lower explosive limits and autoignition temperature help determine the degree of hazard a flammable liquid may present. OSHA assigns flammable categories based on a liquid's flashpoint and boiling point:

	Flashpoint	Boiling Point
Category 1	below 73.4°F (23°C)	at or below 95°F (35°C)
Category 2	below 73.4°F (23°C)	above 95°F (35°C)
Category 3	at or above 73.4°F (23°C) and at or below 140°F (60°C)	
Category 4	above 140°F (60°C) and at or below 199.4°F (93°C)	

Storage of flammables

Improper storage of flammables is a common cause of workplace fires. Outdoor storage buildings and indoor storage cabinets help minimize the potential for fires and explosions caused by flammable liquids.

Outdoor storage buildings allow larger quantities of flammable liquids to be securely stored outdoors. Local codes often dictate the design criteria of these buildings, which can include features such as air conditioning, mechanical venting, segregated sumps and fire suppression systems.

Safety cabinets are more commonly found in facilities whose use of flammable liquids is incidental to production processes. Safety cabinets help segregate flammable liquids from other fluids in the workplace and provide heat resistance to minimize the risk of dangerous fires or explosions. Cabinets also allow smaller amounts of flammable liquids to be stored closer to the point of use, minimizing frequent trips to central dispensing areas.

OSHA and NFPA both specify the minimum construction and design criteria for safety cabinets.

Determining the amount of flammable liquids that can be stored in various areas of the facility is important when choosing flammable safety cabinets. A maximum of 60 gallons of Category 1, 2 or 3 flammable liquids or 120 gallons of Category 4 flammable liquids can be stored in any single storage cabinet [29 CFR 1910.106(d)(3)(i)]. Additionally, no more than three cabinets may be placed in a single fire area. Some state and local ordinances have more stringent requirements.

Required cabinet design and safety features



Joints, seams and doors

Airtight joints and seams, as well as doors that stay securely closed are required safety elements for cabinets designated for storage of flammable liquids.



Conspicuous labeling

Cabinets must be labeled with highly visible, easily read labels, i.e., "Flammable — Keep Fire Away."



Zinc latch

A three-point lock is required to help keep cabinet doors closed, and a sturdy, reliable latch ensures spark-free closing every time.



Leakproof sump

A 2" H built-in sump and door sill is necessary to contain leaks, drips and small spills to keep liquids from draining out onto the floor.





Regulations and codes

Because flammable liquids can present a hazard to workers, OSHA regulates their use, storage and handling in the workplace. Tanks, containers, storage cabinets, pumps and vents are among the items that must meet stringent safety specifications to help ensure safety.

The National Fire Protection Agency (NFPA) has also published numerous standards to help facilities safely manage flammables. OSHA recognizes the NFPA Code 30 standard for the use and storage of flammables, and has incorporated the standard into regulation.

Some state and local governments also recognize Uniform Fire Code (UFC) Standards in addition to the requirements set forth by OSHA and the NFPA. Local fire marshals are a good resource to help determine which standards and regulations are applicable at any particular facility.

Independent testing laboratories like Factory Mutual (FM) and Underwriters Laboratories (UL) test products that will be used with flammables to ensure that they meet regulatory requirements and other standards. In addition to extensive initial testing, products must be retested when changes are made, or at least every three years to maintain their certification.

Design of tanks, containers, storage cabinets, outdoor storage buildings, pipes, pumps and dispensing faucets are among the products that must meet highly defined standards to be certified for use with flammable liquids.

Creating a safer workplace

Identifying flammable liquids used in the workplace and understanding their properties is the first step toward safer storage and management. Using this knowledge to select safety cabinets, cans, and other products that are specifically designed, tested and certified for use with flammables will increase worker safety and help minimize the potential for fires and explosions.

Categories of common flammable liquids

Category 1 Chemicals

Acetaldehyde
Ethyl Chloride
Ethyl Ether
Ethylamine
Methyl Ethyl Ether
Propylene Oxide

Category 3 Chemicals

Butyl Alcohol
Dibutyl Ether
Diesel Fuel No. 1-D
Turpentine

Category 2 Chemicals

Acetone
Benzene
Carbon Disulfide
Cyclohexane
Cyclohexanone
Denatured Alcohol
Diethylamine
Ethanol
Ethyl Acetate
Gasoline
Isopropyl Alcohol
Jet Fuel (JP4)
Methanol
Methyl Ethyl Ketone
Naptha
Toluene
Xylene

Category 4 Chemicals

Aniline
Ethylene Glycol

SAFETY CABINETS PROTECT WORKERS FROM THE HAZARDS OF FLAMMABLE LIQUIDS.

